

CLAIMS

- 5 1. A method of continuously or semi-continuously producing a solid product comprising precipitated calcium carbonate in an aqueous medium which method comprises delivering an aqueous suspension of calcium hydroxide in sequence through a series of at least two static in-line mixers whilst carbon dioxide is introduced into the suspension at or before each of
- 10 the mixers whereby carbon dioxide and the aqueous suspension are intimately mixed in each mixer to facilitate reaction of the carbon dioxide with calcium hydroxide dissolved in the aqueous medium, the calcium hydroxide in the suspension delivered to
- 15 the series of static in-line mixers being progressively consumed and converted to calcium carbonate as the suspension passes through the series.
- 20 2. A method as claimed in claim 1 and wherein the series of in-line static mixers comprises at least three such mixers.
3. A method as claimed in claim 2 and wherein the series of in-line static mixers comprises from four to seven such mixers.
- 25 4. A method as claimed in claim 1 and wherein each of the static in-line mixers comprises an outer casing and a plurality of internal static vanes or

baffles which cause the suspension to undergo changes of direction.

5. A method as claimed in claim 1 and wherein each of the static in-line mixers permits carbon dioxide
5 to be uniformly distributed through the mixed suspension in the form of fine bubbles.

6. A method as claimed in claim 1 and wherein the aqueous suspension enters the first of the series of mixers at a hydraulic pressure in the range 50kPa to
10 100kPa.

7. A method as claimed in claim 1 and wherein the hydraulic pressure of the aqueous suspension progressively falls as it passes through the series of static in-line mixers.

15 8. A method as claimed in claim 1 and wherein carbon dioxide is delivered to be mixed with the suspension in the first in-line mixer in the series at a pressure in the range 50kPa to 150kPa.

9. A method as claimed in claim 8 and wherein the
20 carbon dioxide is delivered to be mixed with the suspension in at least two subsequent in-line mixers in the series at pressures reduced progressively from mixer-to-mixer.

10. A method as claimed in claim 1 and wherein the
25 carbon dioxide to be mixed with the suspension in each in-line static mixer is delivered along a separate conduit for each mixture with the suspension.

11. A method as claimed in claim 10 and wherein the carbon dioxide delivered along each conduit is provided by a common source.

12. A method as claimed in claim 10 and wherein each
5 conduit incorporates means for independently adjusting the pressure of the carbon dioxide delivered to be mixed with the aqueous suspension.

13. A method as claimed in claim 1 and wherein the aqueous suspension includes non-consumable solids to
10 be entrained by and bonded to the precipitated calcium carbonate produced in the aqueous medium.

14. A method as claimed in claim 13 and wherein the non-consumable solids comprise fibres and/or particles.

1121 15. A method as claimed in claim 13 and wherein the
15 non-consumable solids comprise cellulose fibres and/or inorganic pigment particles.

16. A method as claimed in claim 14 and wherein the non-consumable solids comprise fines.

20 17. A method as claimed in claim 16 and wherein the fines have been obtained from an aqueous effluent of an industrial process.

18. A method as claimed in claim 17 and wherein the fines have been obtained from an aqueous effluent
25 from a paper making or paper coating process.

19. A method as claimed in claim 1 and wherein the non-consumable solids constitute from 0.5% to 20% by

weight of the aqueous suspension of the non-consumable solids in the aqueous medium.

20. A method as claimed in claim 13 and wherein the ratio by dry weight of the non-consumable solids to calcium hydroxide delivered to be mixed with carbon dioxide in the first in-line static mixer is in the range 1:10 to 10:1.

21. A method as claimed in claim 20 and wherein an aqueous suspension of the non-consumable solids and an aqueous suspension of the calcium hydroxide are mixed together in a static in-line mixer to produce the aqueous suspension to be delivered to the first in-line static mixer.

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